Power Switching & Controls
for *Business-Critical Continuity*™

# ASCO *Series 230 Automatic Transfer Switch*

ASCO

EMERSON
Network Power

*Global Headquarters-Florham Park, New Jersey*

# ASCO

ASCO was founded in 1888, and manufactured the first ATS in 1920, ASCO focuses on the development of ATS, and has become the leader in the ATS industry.

The picture on above is ASCO's headquarters, located in Florham Park, New Jersey. ASCO has more than 1600 employees and more than 4 factories covering over 500,000 square feets of manufacturing floor space in North America and Asia. ASCO has installed more than 500,000 automatic transfer switches worldwide. No other manufacturer comes close.

## The more you know, the more confidence you have in choosing ASCO

ASCO provides diversified products and solutions to match different requirements:

- Automatic Transfer Switch ATS
- Closed Transition Transfer Switch CTTS
- Delayed Transition Transfer Switch DTTS
- Automatic Transfer Bypass-Isolation Switch ATB
- Automatic Closed Transition Bypass-Isolation Switch ACTB
- Static Transfer Switch STS
- Soft Load Transfer Switch SLTS
- Medium Voltage Automatic Transfer Switch MVATS
- Medium Voltage Closed Transition Transfer Switch MVCTTS
- Three Position Automatic Transfer Switch Center-off
- Multi-Sources Transfer System
- Multi-Generator Parallel Power Connection Systems
- Emergency Power Management System
- Lighting Control Contactors
- Surge Protection Device

## ASCO Standards

- GB14048.11
- IEC/EN 60947-6-1
- UL1008
- NFPA20,70,99,110
- IEEE241.446
- NEMA ICS101993

*The Recognized Leader in Power Transfer Switch Technology Offers the Most Advanced Transfer Switches in the World.*

## Product Overview

The Series 230 automatic transfer switch consists of an intelligent controller and a modular load break switch which automatically transfers the load to the emergency power source when it detects under/over voltage, under/over frequency, or phase failure. The switch has three operation positions (source one - center off - source two). The two sources can be isolated in the center off position. A position locking mechanism is also provided.

## Application

The Series 230 capacity is up to 400A, available from 220 to 415 volts, 50 and 60Hz, single phase and three phase. Typical applications include office buildings, residential buildings, telecom, hospital, subway, data center, military, transportation, and fire pump applications.

## Parameter

| Rated Operational Current Ie (A) | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 225 | 250 | 315 | 400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated Insulation Voltage $U_i$ (V) | | 800 | | | | | | | | 800 | | | 800 | |
| Rated Impulse Withstand Voltage $U_{imp}$ (kV) | | 8 | | | | | | | | 12 | | | 12 | |
| Rated Operation Voltage $U_e$ (V) | | 220, 230, 240, 380, 400, 415 | | | | | | | | | | | | |
| Rated Frequency (Hz) | | 50 / 60 | | | | | | | | | | | | |
| Poles | | 2, 3, 4 | | | | | | | | | | | | |
| Rated Short-Time Withstand Current $I_{cw}$ (kA, RMS) | | 10 (0.1s) | | | | | | | | 15 (0.1s) | | | 25 (0.1s) | |
| Rated Short-Circuit Making Capacity $I_{cm}$ (kA, PEAK) | | 17 | | | | | | | | 31.5 | | | 65 | |
| Withstand and Close-On Rating $I_q$ (kA) | When Used With Current Limiting Fuses | 65 | | | | | | | | 200 | | | 200 | |
| | When Used With Specific Circuit Breakers | | | | | | | | | 150 | | | 150 | |
| Making and Breaking Capacity | | 10 $I_e$ | | | | | | | | | | | | |
| Mechanical Operation Performance (cycles) | | 10,000 | | | | | | | | | | | | |
| Utilization Category | | AC - 33B | | | | | | | | | | | | |
| Operation Voltage range (AC) | Ue=220V / 230V / 240V / 380V / 400V | (0.7 ~ 1.2) × Ue | | | | | | | | | | | | |
| | Ue= 415V | (0.7 ~ 1.15) × Ue | | | | | | | | | | | | |
| EMC Class | | Class A | | | | | | | | | | | | |
| Wiring Way | | Front | | | | | | | | | | | | |
| Separate Lock Mechanism | | Standard | | | | | | | | | | | | |
| Auxiliary Contact | | Optional (8 contacts maximum) | | | | | | | | | | | | |

# ASCO Series 230 Automatic Transfer Switch Product Features

## Performance feature

- Meets or exceeds the requirements of the following regulatory agencies
- EN60947-6-1/IEC60947-6-1: transfer switching
- EN55022: Radiated and Conducted Emission, Class A
- EN61000-3-2: Harmonic Current Emission, Class A
- EN61000-3-3: Limits of Voltage fluctuation and Flicker
- EN 61000-4-5: Immunity to Surge
- EN 61000-4-4: Immunity to Electrical Fast Transient:
- EN61000-4-2: Immunity to Electrostatic Discharge
- EN61000-4-3: Immunity to Radiated Electric Fields
- EN 61000-4-6: Immunity to Continuous Conducted Interference

## Structure

- PC Class ATS
- High ability of withstanding lightning strikes (40kA 8/20μs)
- Simple reliable mechanism, compact and stylish appearance
- Modular design, convenient operation, easy maintenance
- Three operation positions. Two sources can be isolated in the center-off position

## Arc Extinguish

- The utilization category is AC-33B, and the ability of withstand and break is10 $I_e$
- Rotating dual contacts design extinguishes the arc quickly and effectively
- Arcing contacts and main contacts are separate, avoids main contacts from being destroyed by an arc
- Clamping contacts are self cleaning wiping action type
- High short-circuit closing ability

## Switching Mechanism

- Both automatic and manual operation are available
- Unique contacts design limits contact bounce
- Unique clutch technique makes manual operation easy to do
- Electrical and mechanical interlocks prevent two sources from connecting simultaneously
- Innovative motor circuit protection technique, provides precision control
- Cast steel bevel gear mechanism provides high transmission efficiency, and extends the operation life

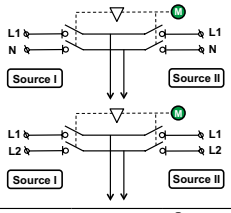
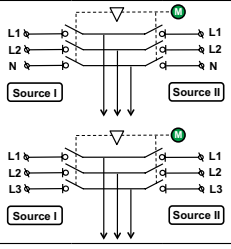
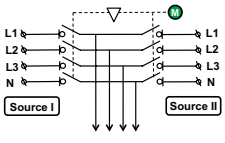
## Controller

- Different Operating Modes (Source I priority/ No Source priority)
- C2000 has ability to work with external 24VDC power supply
- High frequency switching power supply, and wide power voltage range
- Controller remains operational when power is lost, and avoids data loss
- Diagnosis fault intelligent with self - protection function (Motor-Protection)
- RS485 communication interface is available

*Make Life and Business More Reliable*
*By Using ASCO*

# ASCO Series 230 Transfer Switch Ordering Information

**Type sample:** **Switch category**

| B2ADTL | B3 | 250 | H | E | 0 | 0 | Line and Neutral | | | | AC Voltage (V) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | Poles | L1 | L2 | L3 | N | L-L | L-N |
| | B1 | | D |  | | | 2P | √ | | | √ | - | 220 |
| | B1 | | E | | | | | √ | | | √ | - | 230 |
| | B1 | | F | | | | | √ | | | √ | - | 240 |
| | 02 | | C | | | | | √ | √ | | | 208 | |
| | 02 | | D | | | | | √ | √ | | | 220 | - |
| | 02 | | E | | | | | √ | √ | | | 230 | - |
| | 02 | | F | | | | | √ | √ | | | 240 | - |
| | B2 | | D |  | | | 3P | √ | √ | | √ | 220 | 110 |
| | B2 | | E | | | | | √ | √ | | √ | 230 | 115 |
| | B2 | | F | | | | | √ | √ | | √ | 240 | 120 |
| | 03 | | C | | | | | √ | √ | √ | | 208 | - |
| | 03 | | D | | | | | √ | √ | √ | | 220 | - |
| | 03 | | H | | | | | √ | √ | √ | | 380 | - |
| | 03 | | J | | | | | √ | √ | √ | | 400 | - |
| | 03 | | K | | | | | √ | √ | √ | | 415 | - |
| | B3 | | C |  | | | 4P | √ | √ | √ | √ | 208 | - |
| | B3 | | D | | | | | √ | √ | √ | √ | 220 | - |
| | B3 | | H | | | | | √ | √ | √ | √ | 380 | 220 |
| | B3 | | J | | | | | √ | √ | √ | √ | 400 | 230 |
| | B3 | | K | | | | | √ | √ | √ | √ | 415 | 240 |

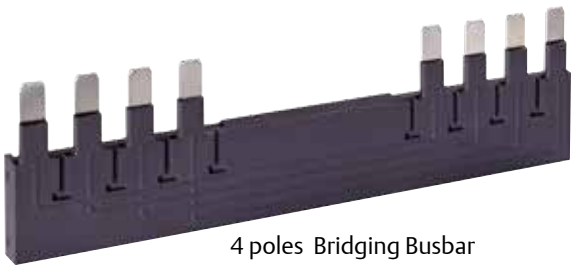
| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ① | Frame | B2ADTL | B2ADTL Frame 32A-160A | | | | | | | |
| | | C2ADTL | C2ADTL Frame 200A-250A | | | | | | | |
| | | D2ADTL | D2ADTL Frame 315A-400A | | | | | | | |
| ③ | Amps | 0032 | 32A | | 0100 | 100A | | 0250 | 250A | |
| | | 0040 | 40A | | 0125 | 125A | | 0315 | 315A | |
| | | 0050 | 50A | | 0160 | 160A | | 0315 | 315A | |
| | | 0063 | 63A | | 0200 | 200A | | 0400 | 400A | |
| | | 0080 | 80A | | 0225 | 225A | | | | |
| ⑤ | Controller | D | C1000 Controller | | | | | | | |
| | | E | C2000 Controller | | | | | | | |
| ⑥ | Optional Accessories | 0 | Without Accessories | | | | | | | |
| | | X | B2ADTL Frame Bridging Bus Bar: 132JA ~ 132JC, Auxiliary Contacts: 132A ~ 132F See Page 5 | | | | | | | |
| ⑦ | Enclosure | 0 | Without Enclosure | | | | | | | |

# Optional Accessory Model Description and Order Information

## B2ADTL Frame Bridging Bus Bar

132 J A

- A: Poles
  - A: 2 poles
  - B: 3 poles
  - C: 4 poles
- Function Code 132J: Bridging Busbar



4 poles Bridging Busbar

For example: ***132JC*** , means Bridging Busbar for a 4 poles transfer switch

## Auxiliary Contacts

132 A A

- A: Auxiliary Contact Quantity
  - BLANK: 1 contact
  - A: 2 contacts
  - B: 3 contacts
  - C: 4 contacts
- Function Code 132A-132F: Auxiliary Contact

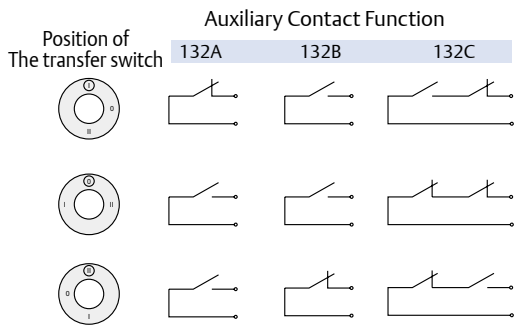
Auxiliary Contact

For example: ***132BA*** , means 2 sets of contacts, closed when the ATS transfer to source II position.

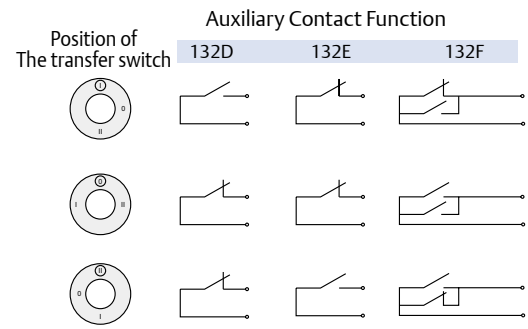
## The Auxiliary Contact Definition

132A-132C : The auxiliary contacts can be used to indicate positions with the CLOSE contact , see Schematic 1.

132D-132F: The auxiliary contacts can be used to indicate positions with the OPEN contact ,see Schematic 2.




Schematic 1 132A-132C Diagram

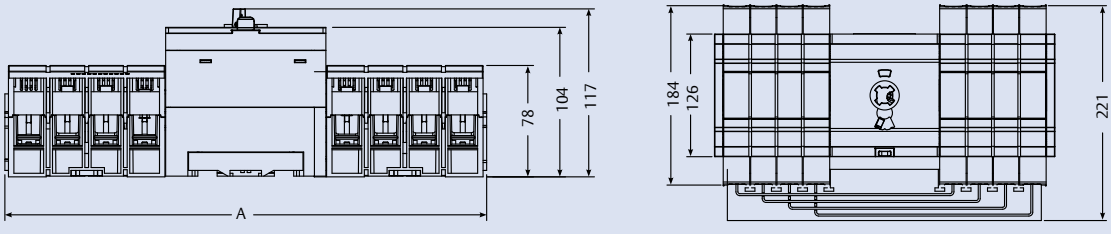



Schematic 2 132D-132F Diagram

*Avoid Losing Critical information*
*When Power is Lost*

# ASCO Series 230 Dimensions and Weight

## B2ADTL Frame

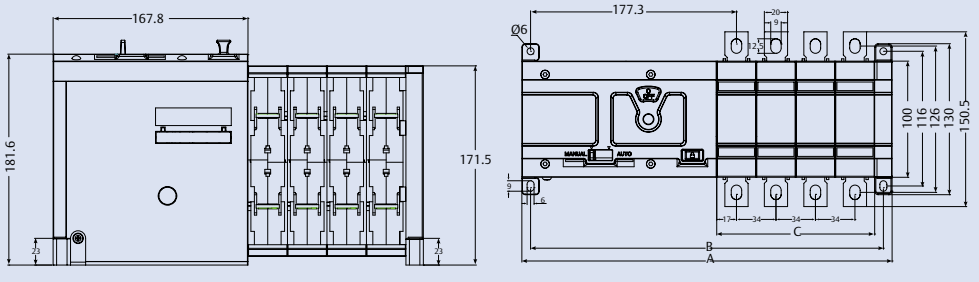



(unit: mm)

| B2ADTL | | 2P | 3P | 4P |
|---|---|---|---|---|
| Size (mm) | A | 241.0 | 349.0 | 349.0 |
| Weight (kg) | | 2.6 | 2.8 | 2.8 |

Note: It must be installed in DIN35 Rail to the cabinet

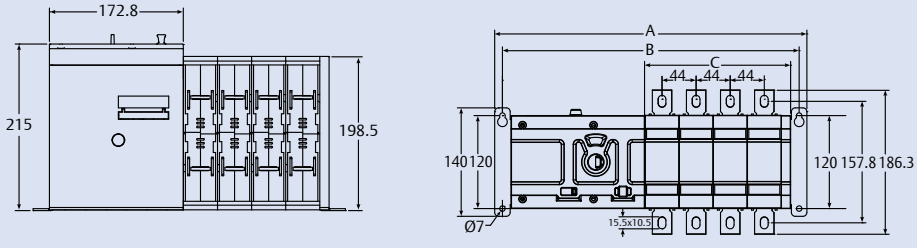
## C2ADTL Frame



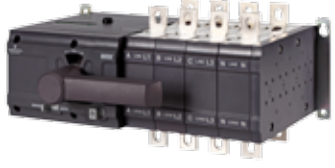

(unit: mm)

| C2ADTL | | 2P | 3P | 4P |
|---|---|---|---|---|
| Size (mm) | A | 251.0 | 285.0 | 319.0 |
| | B | 236.0 | 270.0 | 304.0 |
| | C | 68.0 | 102.0 | 136.0 |
| Weight (kg) | | 4.6 | 5.2 | 5.8 |

## D2ADTL Frame




(unit: mm)



| D2ADTL | | 2P | 3P | 4P |
|---|---|---|---|---|
| Size (mm) | A | 317.0 | 361.0 | 405.0 |
| | B | 297.0 | 341.0 | 385.0 |
| | C | 103.0 | 147.0 | 191.0 |
| Weight (kg) | | 8.6 | 9.8 | 11.0 |

## Shipping Dimensions and WeightsShipping Dimension and Weights (Including TS and controller, without options)

| Frame | Width (MM) | Height (MM) | Depth (MM) | Weight (KG) with C1000 | | | Weight (KG) with C2000 | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 2P | 3P | 4P | 2P | 3P | 4P |
| B2ADTL | 602 | 220 | 267 | 4.9 | 5.5 | 5.7 | 5.2 | 5.8 | 6.0 |
| C2ADTL | 602 | 335 | 227 | 8.9 | 9.5 | 10.1 | 9.2 | 9.8 | 10.4 |
| D2ADTL | 650 | 350 | 300 | 13.0 | 14.5 | 16.0 | 13.4 | 14.9 | 16.4 |

** All information is subject to change, for the latest information please contact ASCO sales team.*

*ASCO Power Transfer Switch Solutions for Powerful Peace of Mind*

# Series 230 Controller Feature Comparisons

## C1000 Controller

### Voltage and Frequency Sensing

- 3-Phase under and over voltage settings on source I and source II
- Phase lose sensing on source I and source II
- Under and over frequency settings on source I and source II

### Time Delays

- Time delay sensing accuracy is ±1%
- Transfer time delay can be set manually

### Controller Display and Keypad

- LED display
- Touch pad for clearing alarm and manual operation
- Switch position indicator lights
- Source acceptability indicator lights

### Operating Modes

- Automatic and manual operation available
- Source I Priority/ No Source Priority

### Center-off with time delay and center-off with protection

- The center-off time delay can be set to avoid large current rushes to inductive loads
- Center-off with protection is available to protect critical loads (e.g. Fire Pump)

### Remote Control and Communication

- Can control switch remotely (e.g. Position Control, Time Delay, etc.)
- Fire control signal input (24VDC)

### Power Supply of Controller

- Operation Voltage (VAC): 220/ 230/ 240/ 380/ 400/ 415

## C2000 Controller

### Voltage and Frequency Sensing

- 3-Phase under and over voltage settings on source I and source II
- Under and over frequency settings on source I and source II
- Voltage unbalance detection between phases

### Time Delays

- Time delay can be set by operating parameter setting menu
- Time delay sensing accuracy is ±1%
- Time delay can be set under different working modes
- Transfer time delay can be set manually

### Controller Display and Keypad

- LCD display
- Touch pad for programming the features and settings
- Switch position indicator lights
- Source acceptability indicator lights

### Operating Modes

- Automatic and manual operation available
- Source I Priority/ No Source Priority

### Center-off with time delay and center-off with protection

- The center-off time delay can be set to avoid large current rushes to inductive loads
- Center-off with protection is available to protect critical loads (e.g. Fire Pump)

### Events Display

- Event log displays: 100 logged events with time and date of each event, event type and event reason

### Remote Control and Communication

- Uses RS485 interface, and supports MODBUS Communication
- Can control switch remotely (e.g. Position Control, Time Delay, etc.)
- Fire control signal input (24VDC)

### Power Supply of Controller

- Operation Voltage (VAC): 220/ 230/ 240/ 380/ 400/ 415
- C2000 has ability to work with 24VDC power supply

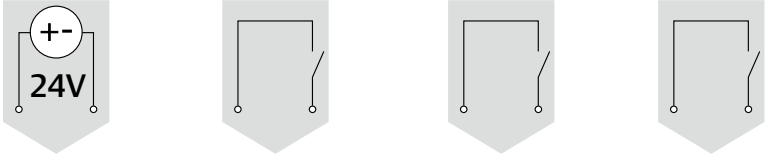
*24-hours Protection No Matter When Trouble Strikes*

| Controller | C1000 | C2000 |
|---|---|---|
| Intended Application | Residential, Light Commercial | Commercial, Industrial |
| Rated Operation Voltage $U_e$ (V) | 220/230/240/380/400/415 | 220/230/240/380/400/415 |
| Rated Frequency (Hz) | 50/60Hz | 50/60Hz |
| Display Indicator | | |
| Source I Available | ■ | ■ |
| Source II Available | ■ | ■ |
| Source I Accepted (Load Connected) | ■ | ■ |
| Source II Accepted (Load Connected) | ■ | ■ |
| Center-off Position | ■ | ■ |
| Control Mode | | |
| Manual/Automatic | ■ | ■ |
| Source I Priority | ■ | ■ |
| No Source Priority | ■ | ■ |
| Source Sensing Setting | | |
| Phase Selection | | ■ |
| Source I Voltage | ■ | ■ |
| Source II Voltage | ■ | ■ |
| Source I Frequency | ■ | ■ |
| Source II Frequency | ■ | ■ |
| Source I power loss | ■ | ■ |
| Source II power loss | ■ | ■ |
| Source I phase loss | ■ | ■ |
| Source II phase loss | ■ | ■ |
| Source I Voltage Dropout (Undervoltage) | 70% or 85% | 70% to 98% |
| Source II Voltage Dropout (Undervoltage) | 70% or 85% | 70% to 98% |
| Source I Overvoltage Trip | OFF or 120% [1] | 102% to 120% or OFF[1] |
| Source II Overvoltage Trip | OFF or 120% [1] | 102% to 120% or OFF[1] |
| Source I Overfrequency Transfer | 110% or 115% | 102% to 115% |
| Source II Overfrequency Transfer | 110% or 115% | 102% to 115% |
| Source I Frequency Dropout (Underfrequency) | 85% or 90% | 85% to 98% |
| Source II Frequency Dropout (Underfrequency) | 85% or 90% | 85% to 98% |
| Source I Voltage Pick Up | 75% or 90% | 85% to 100% |
| Source II Voltage Pick Up | 75% or 90% | 85% to 100% |
| Source I Frequency Pick Up | 90% or 95% | 90% to 100% |
| Source II Frequency Pick Up | 90% or 95% | 90% to 100% |
| Time Delay Setting | | |
| Override Momentary Source I Outage | 0 to 3 Seconds | 0 to 3 Seconds |
| Override Momentary Source II Outage | 0 to 3 Seconds | 0 to 3 Seconds |
| Transfer to Source I | 1s to 30 Minutes | 0 to 30 Minutes |
| Transfer to Source II | 0 to 5 Minutes | 0 to 5 Minutes |
| Engine Cooldown | 5 Minutes Fixed | 0 to 60 Minutes |
| Center-Off Position Delay | OFF or 5 Seconds | 0 to 5 Seconds |
| Others | | |
| RS-485 | | ■ |
| Modbus | | ■ |
| 24VDC Capable | | ■ |
| Generator Control Signal Output | ■ | ■ |
| Fire Control Signal Input | ■ | ■ |
| Alarm | ■ | ■ |
| Auxiliary Contact | Optional | Optional |
| Events Log | | ■ |
| Display Type | LED | LED+LCD |
| Installation | Din rail installation and Panel installation | Panel installation |

■-Yes, Standard Blank-Not Available/ Not Applicable

[1] the controller used on 415V, its Overvoltage Droupout is 115% both on Source I and Source II

# C1000 Controller Port Function Description



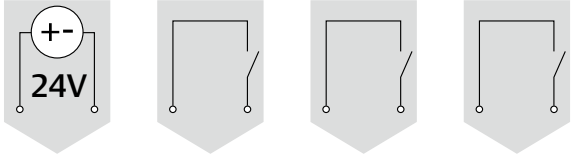

| | | | | | |
|---|---|---|---|---|---|
| Generator start | Alarm | Fire control input | Transfer to Position O | Transfer to Position I | Transfer to Position II |
| GEN | ALM | FIRE | DI5 | DI6 | DI7 |
| **X3 User terminal** | | | | | |
| **C1000 CONTROLLER** | | | | | |
| **X1 Power terminal** | | | **X2 control terminal** | | |
| Voltage Detection | | | Transfer switch position detection and transfer control | | |
| | | | | | |

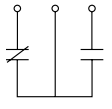
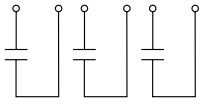
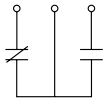
**To Transfer Switch X1**

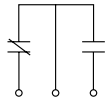
**To Transfer Switch X2**

*Critical Loads Demand ASCO*

# C2000 Controller Port Function Description

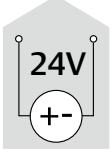


| Alarm | O I II TS position | | | Generator start | RS485 | Fire control input | Transfer to Position O | Transfer to Position I | Transfer to Position II |
|---|---|---|---|---|---|---|---|---|---|
| ALM | DO1 | DO2 | DO3 | GEN | 485 PORT | FIRE | DI5 | DI6 | DI7 |
| **X4 User terminal** | | | | | | | | | |
| **C2000 CONTROLLER** | | | | | | | | | |
| **X1 Power terminal** | | | | **X2 control terminal** | | | | **X3 User terminal** | |
| Voltage Detection | | | | Transfer switch position detect and transfer control | | | | 24V DC power input | Lost power |
| | | | | | | | | |  |

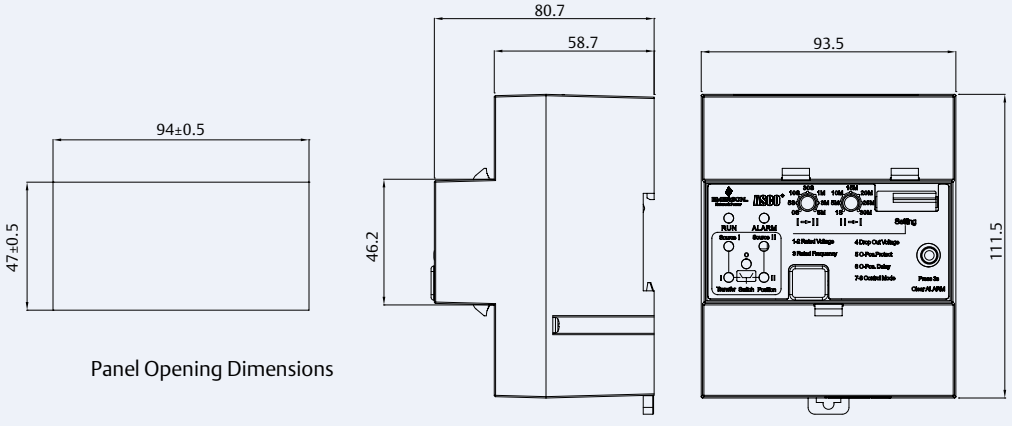
To Transfer Switch X1

To Transfer Switch X2



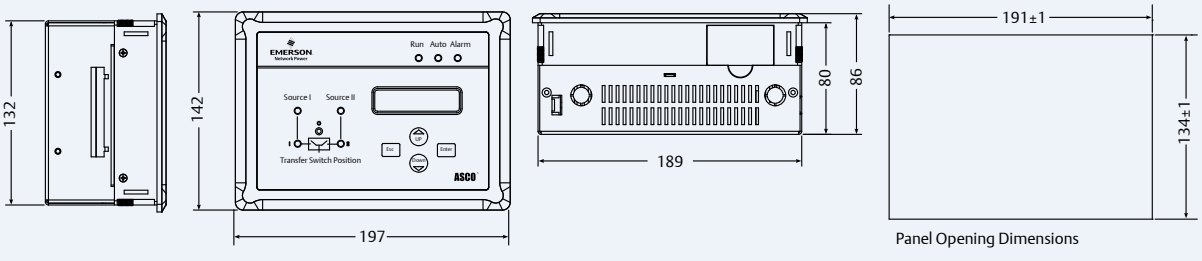
# Controller Dimensions and Weight*

## C1000 Controller




Weight: 0.74kg
(unit: mm)

## C2000 Controller




Weight: 1kg
(unit: mm)

*Not Shipping weight, Actually unit weight

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E-X6216497-0413

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